

Chapter 11

HAZMAT Incidents and Fire Procedures

11-1. This chapter sets the doctrinal standards for actions that the initial-response team will take when responding to a HAZMAT release in the TO. The chapter also outlines the minimum requirements and specific operating guidelines that should be considered when dealing with HAZMAT incidents. All Army fire-fighting teams and soldiers who respond to HAZMAT incidents and the incident commanders who are responsible for managing HAZMAT incidents should follow these recommendations.

SECTION I. HAZMAT INCIDENTS

SCOPE

11-2. Engineer fire-fighting teams will initially handle HAZMAT incidents that they encounter during operations in a combat environment or stability operations and support operations. The degree of response and mitigation of the incident will depend on available resources and the danger to personnel and equipment. The mission of the fire-fighting teams is to provide initial control and containment, investigate, decontaminate, safeguard, and secure the scene of the HAZMAT incident.

11-3. The following items are guidelines for initial-response teams dealing with HAZMAT incidents in a TO. Most of the guidelines also apply to installation fire-fighting detachment initial-response teams.

- Initial-response teams do not correct HAZMAT release sites. They will do everything possible to contain a spill. A specialist (probably contracted) will correct a situation.
- Since each initial-response team is different, the area commander will establish an initial-response team or teams to meet the threat of a HAZMAT release.
- Releases that will require an initial response are located in the rear areas.
- Releases in a main battle area will not require an immediate response; however, they must be corrected after a battle is over.
- During contingency operations, a HAZMAT incident may require initial-response actions, depending on the mission and the HN's requirements.

RESPONSIBILITIES

11-4. Whether military or civilian, all leaders must know how and what to do in case of a HAZMAT incident. The following paragraphs will define those responsibilities and who must carry them out. Regardless of size, a HAZMAT incident can have a serious impact on an operation in either a tactical or nontactical environment.

DEPLOYED MILITARY PERSONNEL

11-5. All military and civilian personnel deployed to a TO will immediately report incidents involving hazardous wastes (HWs) or HAZMATs through their chains of command. All commanders will forward the reports of these incidents to the division or corps Assistant Chief of Staff, G3 (Operations and Plans) (G3).

FIRE-FIGHTING TEAMS

11-6. All fire-fighting units responsible for HAZMAT incidents will be prepared to respond to all HAZMAT incidents within their AO. The primary operational goal of the fire-fighting teams/HAZMAT response teams when dealing with HAZMATs will be isolating and containing the materials.

INCIDENT COMMANDER

11-7. The incident commander will assume control of the scene beyond the capabilities of the first-responder's awareness level. The commander must have training at least equal to that of the operational-level responder's and have additional training relating to HAZMAT incident management. No matter what the level of the incident or the personnel operating at an incident, the incident commander must be trained and competent in the following areas:

- The unit's SOPs and the TO's response plans.
- The emergency operations plans.
- The hazards and risks of operating at a scene.
- The unit's and HN's resources.
- The importance of decontamination.
- Incident-reporting requirements for before-, during-, and after-response operations.

11-8. The incident commander works from the strategic level and develops the overall response objectives; he should not become involved in tactical operations. He is responsible for the safety of the response personnel, the soldiers in an affected vicinity, and the public. He controls an incident and ensures that only minimal harm occurs to the environment and property.

HAZMAT-INCIDENT RESPONSE PROCEDURES

11-9. The fire-fighting teams and the SFO or noncommissioned officers (NCOs) arriving on the scene of a HAZMAT incident must meet many basic

objectives. These objectives parallel those associated with a fire response and include the following:

- Sizing up the situation and establishing command.
- Controlling access to the scene, securing the scene, and isolating the hazard.
- Identifying the hazard and evaluating the risk.
- Rescuing and evacuating personnel and victims.
- Staging the resources.
- Confirming that applicable hazardous-substance-release reporting requirements have been met.
- Reevaluating the situation (ongoing).

SIZING UP AND ESTABLISHING COMMAND

11-10. The first step in a HAZMAT incident is to size up the situation and establish command. Sizing up is an ongoing process and impacts all the phases of planning and decision making that take place during any incident. Sizing up starts when an incident is dispatched and continues through the entire incident as more information is obtained. Upon receiving a report of a potential HAZMAT incident from military, civilian, or HN sources, the LA team shall initiate a HAZMAT response.

NOTE: HAZMAT incidents could affect tactical missions; the local commands should be contacted immediately.

11-11. An initial HAZMAT response may consist of—

- First responders.
- A local unit/area response team, if applicable or available.
- An incident commander.
- Other fire-fighting teams.

11-12. A HAZMAT incident requires a more cautious, methodical, and deliberate sizing up than most fire situations. Prematurely committing equipment and personnel to unknown, potentially hazardous situations or locations must be avoided. Recognizing and identifying HAZMATs must be performed first. (In HAZMAT incidents involving military personnel and equipment, response teams should already know what materials are involved because of the placards that are on the containers or buildings and the documentation that is on file.)

11-13. After sizing up the situation, the incident commander will establish a set of objectives and the amount of resources that are needed to accomplish the objectives. Factors such as preplanning information, reports from responsible parties or witnesses, odors, visual factors (placards, labels, container size and shape), time, location, and weather play a vital role in formulating the objectives. The critical step to objective development is identifying the hazard and assessing the potential harm.

11-14. First responders should always size up a situation conservatively, with an orientation toward public health and safety. They should concern themselves with their safety and that of the personnel in the vicinity. The SFO will notify the adjacent units and response teams.

CONTROLLING ACCESS TO THE SCENE, SECURING THE SCENE, AND ISOLATING THE HAZARD

11-15. The first action that the commanding officer should take during a HAZMAT incident is to close all access areas to the scene. (If necessary, he could establish controlled access areas to secure a given area properly and prevent needless exposure to dangerous substances.) If the quantity of chemicals or materials involved in the incident is significant, then the incident commander will advise the area commander and his chain of command.

11-16. In most cases, establishing a controlled access area should start with an outside perimeter and work toward isolating the HAZMAT incident. The *hot*, *warm*, and *cold* zones should be established after the outer perimeter is secured. As soon as the zones are defined, and possibly marked with different tape colors, personnel should be assigned to control entry to the zones. These zones are defined as follows:

- Hot—the area that immediately surrounds a HAZMAT incident and then extends far enough to prevent adverse effects from HAZMAT releases to personnel outside the zone. The zone is also referred to as the exclusion zone or restricted zone.
- Warm—the area where personnel and equipment are decontaminated and the hot-zone support takes place. It includes control points for the access corridor and thus assists in reducing the spread of contamination. The zone is also referred to as the decontamination, contamination reduction, or limited-access zone.
- Cold—the area that contains the command post (CP) and other support functions that are deemed necessary to control an incident. The zone is also referred to as the clean zone or support zone.

11-17. The incident commander will establish control as soon as possible. Doing so is necessary to control and direct the operations and movements of the on-site personnel to prevent possible contamination. A site map that shows wind direction and topography could be helpful. Boundaries for the various control zones are established using information based on the—

- Contaminant.
- Wind speed and direction.
- Degree of risk (toxicity) from the HAZMATs.
- Size and location of the spill or release.
- Tactical situation.
- Other factors that are gathered at the incident site.

11-18. Personnel should move only through the access control points to prevent contamination across the zones. Assigned team members should monitor the control zones to ensure that they are properly located as an

incident progresses. Depending on the incident, the control zones may have to be expanded or reduced.

IDENTIFYING THE HAZARD AND EVALUATING THE RISK

11-19. Once a scene is initially secured, the access controlled, and the hazard isolated, the types of HAZMATs must be more positively identified. The incident commander will secure additional information. Further identification is necessary to assess the risk that the hazards present to the fire personnel, populace, resources, and environment. Knowing more about a HAZMAT allows the first responders or a HAZMAT team to do the following:

- Determine who must be evacuated.
- Define what personal protective equipment must be used.
- Establish the decontamination sites and procedures.
- Relocate the zones and areas as necessary.
- Identify the needed resources.
- Identify any environmentally sensitive areas.
- Determine what experts and contractors may be required.

RESCUING AND EVACUATING PERSONNEL AND VICTIMS

11-20. Another important factor that the incident commander must evaluate is what is needed to rescue and evacuate victims. Firefighters should not attempt rescuing the people at HAZMAT incidents unless their own safety can be assured. Initial rescue actions should be on removing the ambulatory people from immediate danger. The more complicated rescues or extrications should be evaluated first and then a possible rescue attempt made.

11-21. If a victim cannot be saved or is already dead, fire-fighting teams should not attempt a rescue if they will be at risk. They could be exposed to an unknown chemical or a potential explosion, which makes the risk unacceptable. For information on the suggested minimum safe distances for evacuating personnel, see the *North American Emergency Response Guidebook*. When determining the safe distance, fire-fighting teams should use the worst-case criteria, because it is better to evacuate too large an area than too small an area.

11-22. When fire-fighting teams rescue contaminated victims, the incident commander must arrange to isolate, decontaminate, and treat the victims, as well as the rescuers, as possible casualties. Fire-fighting teams, therefore, must be familiar with handling contaminated people, to include having full protective clothing and equipment available. The incident commander may have to establish a holding area for the contaminated victims until they can be decontaminated or the treatment personnel can be protected. This holding area should be located close to the decontamination area and be considered part of the hot zone. Some of the safety considerations that should be

addressed before attempting to rescue victims during a HAZMAT incident emergency are listed below:

- Has the location of the victims been confirmed?
- How much time will the rescue require? Are the victims trapped by a vehicle or other debris?
- Are the victims conscious or responsive?
- How long have the victims been trapped or exposed to the HAZMATs? Can they function on their own?
- Is the leaking material pooling or vaporizing around the victims?
- What are the hazardous properties of the material involved in the incident?
- Is a large fire or explosion likely?
- What is the release rate of the escaping HAZMATs? What is the concentration of the material in the area by the victims?
- Does the PPE that is available to the rescuer offer a reasonable level of protection against the HAZMATs?
- Is the vehicle or the structure resting in a stable position?
- Are the skill and experience levels of the rescuer(s) adequate?
- Are the proper tools available to initiate a rescue?
- Are adequate personnel resources available for support positions, such as fire suppression, safety, and back-up crews?
- Is decontamination possible?

STAGING THE RESOURCES

11-23. Staging is divided into two levels. Level I involves positioning the standard equipment that occurs as part of any routine response. Equipment and personnel are staged as defined by internal SOPs. Level II involves designating an area in a safe location that provides access for the arriving units and for the units that are assigned to work. A Level II area is usually established after the initial size-up is completed. The incident commander ensures that the arriving units are directed into the appropriate staging area.

11-24. In HAZMAT incidents, Level II staging is recommended because it keeps uncommitted units in a safe location. The area must be far removed from a HAZMAT scene to prevent the worst foreseeable outcome from affecting operations. The route to the Level II staging should not expose personnel to any danger. When units are expected to be on standby for a long time, the Level II staging may be placed at the nearest base camp. It can also be in another area that is close to the incident and offers the personnel a place to eat, rest, or plan and review their potential role. The incident commander must keep a sufficient level of resources in the staging area to handle any escalation of an incident.

REEVALUATING THE SITUATION

11-25. The incident commander must constantly reevaluate a HAZMAT incident and his resources as he obtains new information about them. He does this to ensure that the response process will lead to a safe and proper control of the hazard, cleanup, decontamination, and termination of the incident. Also, he must continually update the chain of command and local area commanders.

FIRST RESPONDER

11-26. First responders are those likely to witness or discover a HAZMAT release and those who would be expected to begin emergency-response procedures. First responders include truck drivers, train crews, MP, and others whose duties require them to work in facilities where HAZMATs are transported, stored, or used. Responders are not expected to take any action that would require a great deal of training and experience; their actions are basic and limited.

11-27. First responders may be involved in several different roles and responsibilities at HAZMAT incidents beyond the initial-action stage. The fire-fighting/HAZMAT teams are frequently manned only to a level that allows them to deal with the complex and specialized technical issues during an incident. The other tasks that are required to support a fire-fighting/HAZMAT team must fall to the first responders. They and a HAZMAT team must be able to work together and function as an effective team. This teamwork approach allows the incident commander to manage the incident in a safe and timely manner. First responders are the support system for the HAZMAT team. Tasks typically assigned to first responders include entry control, decontamination, and logistical and medical support. Other tasks that first responders might do include diking and blanketing nonlethal liquid substances or transferring liquids from damaged containers.

ENTRY CONTROL

11-28. First responders may control the entry point from a cold zone to a warm zone. If they do, they can allow only those people with specific assignments and who are wearing the appropriate protective equipment to enter a warm zone. This task may be assigned to the MP who are supporting the AO.

DECONTAMINATION

11-29. Special attention will be given to personnel and equipment during all HAZMAT operations. Efforts will be made to minimize the number of personnel and the amount of equipment in a contaminated area. The specific decontamination procedures necessary to handle a particular product must be determined carefully. Before fire-department personnel enter a contaminated area, the incident commander shall set up a decontamination station. Weather and/or other factors may make decontamination outdoors impossible. If so, the nearest suitable firehouse (or similar facility) shall be used to decontaminate all personnel and apparatus. During the decontamination process, close attention must be given to water runoff. Wherever possible, this water will be collected and properly disposed of.

SUPPORT

11-30. Support may encompass a wide variety of functions to assist a fire-fighting/HAZMAT team, to include—

- Laying out equipment (suits, radios, and tools).
- Logging information.
- Assisting the entry and backup/rescue team in dressing.
- Communicating.
- Moving bulk equipment.
- Providing rapid-reaction teams.

MEDICAL SUPPORT/EMERGENCY MEDICAL SUPPORT (EMS)

11-31. EMS tasks include those usually associated with basic and advanced life-support treatment of patients or personnel exposed to toxic chemicals. Advanced life-support personnel should function under the direction of a military or civilian medical facility that can best meet and manage the victims who were exposed to toxic substances. Medical personnel will remain in the Level II staging area. Only the incident commander can allow them to enter any other area to provide medical services.

INCIDENT COMMAND

11-32. Incident-command procedures should be used at major HAZMAT emergencies. For major emergencies, you will need to use the resources of and coordinate with units outside the local unit for resolution. The incident commander should establish a CP. He must consider the location of a CP carefully to ensure that it is safe from contamination. He will also determine the safe areas and the restricted areas. The restricted areas will have either a hot, warm, or cold zone.

11-33. Personnel and equipment not immediately needed will be maintained in a ready condition within the Level II staging area. The MP may be called on, as needed, to maintain these restricted areas. The incident commander will ensure that the situation is continually monitored to detect any change in spills, run-off, or vapor clouds. Additional evacuation or other measures should be ordered, as needed.

NOTES:

1. When the specific properties and methods of handling a material are absolutely certain, the incident commander will communicate either directly or indirectly with the Chem-Trec Office at (800) 424-9300 CONUS and (703) 483-7616 outside CONUS, 24 hours a day. If you use the outside CONUS number, you can place collect calls and Chem-Trec will accept them.

2. For incidents involving explosives and/or ammunition, call the US Army Operations Center at (703) 697-0218/0219.

SAFETY PROCEDURES AND SITE SAFETY

11-34. When dealing with a HAZMAT release, following safety procedures is critical for a successful mission and the safe removal of the spill in a timely

manner. HAZMAT incidents present unusual threats that may result in immediate injury (burns from a flash gasoline fire) or long-term injury (unexpected future illness from brief exposure to poisons). The severity of harm from exposure to a HAZMAT depends on the composition and basic properties of the material; the dosage, route, and conditions of exposure; the susceptibility of the person exposed; and other factors. All unit personnel must be extremely cautious to ensure minimum exposure.

11-35. Some of the immediate effects of high-level, brief exposures include burns, rashes, nausea, loss of eyesight, and poisoning. Prolonged exposure to low doses of certain materials can cause chronic lung disease, heart disease, or sterility. Firefighters working in a HAZMAT release area must follow specific safety considerations. They must—

- Walk cautiously to avoid tripping.
- Never walk on drums and be very careful when working with stacked drums.
- Always stand to the side when opening doors of vehicles containing HAZMATs.
- Always use a pike pole to open the doors because the items inside the vehicle have probably shifted during the accident.
- Determine the condition of all containers before trying to move them.
- Assume all unlabeled containers contain HAZMATs.
- Stay out of all liquid material when possible.
- Always ground and bond when transferring flammable liquids.
- Stay upwind of the release.
- Spend as little time as possible in the hot zone to avoid prolonged exposure.
- Always have a decontamination area set up.
- Always have a backup team ready.

TECHNICAL INFORMATION

11-36. Early into an incident, the response team should obtain as much information as possible about the immediate and long-term health effects of the material and the way it reacts. All unidentified materials should be considered harmful until proven otherwise.

PROTECTION OF PERSONNEL

11-37. Full protective equipment and clothing should be the minimum protection for all personnel who are in an incident's area. This rule is very important when the HAZMAT class is unknown, the approach to the incident is downwind, or the harmful effects are obvious (for example, victims are down or the surroundings are discolored). Information on health aspects will obviously determine the type of personal protection required to operate safely inside a contaminated area and will ultimately assist the incident commander with determining the response teams' objectives.

OPERATIONS

11-38. Personnel assigned to work in a potentially dangerous HAZMAT area should have an operations plan for that area. The command and the personnel assigned to work in such an area should develop the plan. However, the incident commander and an officer assigned to carry out the operations usually develop the operations plan. Including the incident commander in the developing process helps to—

- Determine the objectives.
- Determine if the proper tools are available for plugging or controlling a spill.
- Reduce exposure time of the personnel at the incident.
- Establish the areas of responsibility.

11-39. The plan should include other factors such as the following:

- Personnel assigned to work within an incident's area should never enter the warm or hot zone until the health risks and how the material reacts have been checked.
- Units are not to enter a vapor cloud or otherwise contaminated area until the area is deemed safe or until personnel wear proper protective clothing.

11-40. Because the conditions in a HAZMAT area can deteriorate at any time, changes may be necessary. Determining and enforcing any changes should be based on an evaluation of the conditions, a judgment of alternatives, and the experience and training of the persons suggesting the changes. Above all, safety in determining and enforcing changes must be the top consideration.

EMERGENCY MEDICAL TREATMENT

11-41. A MEDEVAC vehicle/ambulance should be positioned upwind of a HAZMAT release at the perimeter of the incident's area. Doing so prevents the ambulance and personnel from being contaminated or from spreading a contaminant. Medical personnel should be briefed on the materials involved in an incident so that they can prepare for potential problems. If possible, one fire-fighting team should be assigned to a medical-treatment area to assist with decontamination. The team could help in removing contaminated clothing, operating emergency showers, and administering general treatment. If poisons are involved, the manufacturer and/or a poison-control center for treatment information should be contacted, in case there is injury or contamination.

11-42. When airborne contaminants are involved, additional eyewash kits and oxygen may be needed. Specifically requesting these supplies, rather than additional medical units, may be necessary. There are several problems related to emergency medical personnel safety that should be considered:

- Medical personnel usually do not have positive-pressure SCBA and should not be committed to a dangerous area without protection.

- Victims of HAZMAT incidents may be contaminated and could contaminate emergency medical personnel, hospital personnel, and others.
- Medical personnel should consider the reactivity of HAZMATs when handling victims (for example, oxygen could cause a deflagration).
- Contact lenses of victims should be removed and their eyes flushed well.

PERSONAL PROTECTION EQUIPMENT

11-43. Protecting personnel during a HAZMAT incident must begin before one occurs. A clearly written policy about wearing PPE and clothing must be established and enforced at the unit level. You must learn and know about the necessity of PPE before responding to an incident. Full protection includes the helmet, positive-pressure SCBA, coat, pants, rubber boots, and gloves. Full PPE and clothing prevent vapors, liquids, and solids from contacting the skin.

11-44. At many incidents, your conventional gear is insufficient. For example, corrosives can eat away turnout coats in 1 to 2 minutes. In such an incident, you will need clothing that is especially designed to protect against a specific hazard. You will need vinyl or rubber acid suits, for example, when operating in corrosives, concentrated anhydrous ammonia, and some types of poisons. Several safety problems, and their solutions, associated with PPE and clothing include the following:

COMMUNICATING INSIDE ACID SUITS

11-45. You must adopt and practice hand signals to use when you are in trouble. The most important are—

- “Cool me down.”
- “I’m low on air.”
- “My suit has been breached.”
- “Let’s back out.”

REMOVING FACE PIECES BEFORE LEAVING AN AREA

11-46. Always walk clear of an incident area to where others are breathing without protective equipment. Decontaminate your clothing by letting someone else flush it with water. Never take your gloves off to remove the breathing apparatus face piece until your clothes have been decontaminated.

11-47. If a HAZMAT incident involves poisons or radioactive materials, a separate decontamination site should be established. This area should be used only for cleaning or disposing of equipment. If your clothing has been contaminated with any of these materials, use that site. Also, the runoff water from cleaning should be retained by diking or diverting or by using ponds.

WORKING WITH AN AIR SUPPLY

11-48. Always keep your air cylinders full, and check their gauges before entering an incident area. Never use compressors within 2,000 feet of any HAZMAT incident. Contaminants may enter the filtering system and the

resupplied air cylinder. Never fill cylinders downwind of a spill, leak, or burning fire. The purpose of PPE and clothing is to shield or isolate individuals from the chemical, physical, and biological hazards that they may encounter during HAZMAT responses.

TOOLS AND EQUIPMENT

11-49. Small hand tools are readily accessible, easy to use, and relatively inexpensive. When used with readily available supplies, hand tools can effectively control nearly 80 percent of all HAZMAT container leaks. For example, a 1-inch hole in a leaking gasoline drum can be controlled to a slow drip by driving a wooden plug into the hole. One way to determine the tools you may need is to survey the HAZMAT sites in your response area and compile a kit, or kits, accordingly. Table 11-1 shows a list of items to include in response kits.

Table 11-1. Suggested tools for response kits

Tools	Equipment	Expendable Supplies
Flashlights	Portable hand pumps	Wood and plastic plugs
Pocketknife for carving wooden plugs	Explosimeter	Aluminum and lead tape
Medium-weight ball-peen hammer		Epoxy
Rubber mallet		Gasket materials
Sledge hammer		Drum clamps
8-inch vice grips		Recovery drums/ overpacks
10-inch crescent wrench		
Wire brush with long handle		
Slip-joint pliers		
Bolt cutter capable of cutting heavy chain		
Hacksaw with quick disconnect for blades		
Screwdriver set with various blades		
Ratchet screwdriver		
Pliers, regular and needle nose		
Tin snips		
Sheet-metal shears		
Point, flat, half-round, and rat-tail files		
Chisel set for cutting metal		
Drive socket sets, 3/8 and 1/2 inch		
Box-and open-end wrench set		

SECTION II. HAZMAT FIRE PROCEDURES

NUCLEAR FIRES

11-50. The first person to see a fire involving nuclear materials should use the following procedures:

- Report the fire to the nearest military or municipal fire department.
- Ask the first arriving official (police or fire department) to notify the nearest military installation or EDRA office.
- Give immediate assistance to personnel, when possible.
- Keep away from the fire except to save lives. Highly explosive components may detonate.
- Remain upwind and uphill from the fire.
- Use any available method to prevent smoke from entering your eyes, nose, and throat.

STORAGE FIRES

11-51. Weapon-storage facilities will vary with geographical areas. Normally, a weapon-storage area will be in—

- An underground magazine.
- An earth-covered igloo magazine.
- Outdoor storage.
- Rudimentary storage.

11-52. Personnel at weapon-storage locations are restricted in using flammable materials and flame-producing devices. Because of these restrictions and the high order of supervision and care required, fires seldom occur in these facilities. However, other fire potentials, such as a building's electrical system, the storage hydraulic systems, and the systems on forklifts, may be present and should be considered, eliminated, or controlled. When a fire occurs in a weapon-storage location, the first person to see the fire should use the following procedures:

- Send another person to notify the fire department as soon as possible.
- Apply extinguishing agents immediately to extinguish the fire or control its spread.
- Cut off the electrical power.
- Remove items such as forklifts to a safe area, if necessary.
- Remove all the weapons from the storage location and relocate them a safe distance from the fire, if possible.

RAIL FIRES

11-53. The first person to see a rail fire should—

- Send another person, if possible, to the fire department to get help.
- Apply agents, immediately, from portable extinguishers.
- Isolate the burning car.
- Inspect the burning car's interior to see if the fire has penetrated.
- Fight the fire with any available fire-fighting equipment if the fire has reached the interior but the weapon is still safe from fire.
- Remove all the weapons, if possible.
- Evacuate all personnel when an explosion is imminent.

TRANSPORT-VEHICLE FIRES

11-54. Some of the most common causes of vehicle fires are electrical short circuits, collisions, improper fueling techniques, overheated brakes and tires, broken fuel lines, and careless smoking habits. Because vehicle fires can occur anywhere and anytime, the courier and driver must know and understand the procedures to combat a fire. Personnel who operate transport vehicles should use the following procedures to combat fire emergencies:

- Try to prevent the weapon's highly explosive component from detonating. If possible, separate the burning tractor from the van containing the weapon, apply agents from portable fire-extinguishing equipment, and unload the weapon from the vehicle.
- Evacuate all personnel from the area if the situation involves spillage of flammable liquids or petroleum fuels or the detonation of a weapon's highly explosive component. Roadblocks should be established with a minimum distance of 3/4 mile.

TACTICAL-VEHICLE FIRES

11-55. A fire involving tactical vehicles will vary in origin. Depending on the seriousness and the location of a fire in relation to the weapon, the driver and courier will either combat the fire immediately or evacuate the area before fighting the fire. The local military commander (not the fire-department incident commander) determines the action to take under emergency conditions.

11-56. You need to ascertain whether a fire involves just the ordnance (rockets and missiles) or the ready-to-launch rockets or missiles on a launcher. If a fire involves the carrying vehicle or launcher, try to unload the vehicle and isolate the complete weapon from the fire. If you cannot unload the vehicle, position the vehicle or launcher so that the rocket will impact on a solid earth mass, which will help if the motor ignites.

WEAPON-OPERATION FIRES

11-57. Electrical fires are most likely to occur during electrical testing or monitoring of a weapon. A fire may occur in a warhead section, in the cables

leading to the weapon, or in the test equipment. Only qualified personnel should deal with electrical fires. Personnel at the storage site should use the following fire-fighting procedures when weapons are not in shipping containers:

- Use a fire extinguisher to fight a fire while it is in the incipient state.
- Cut off the power from the weapon or tester. If smoke or flames emanate from the wiring, use Halon to extinguish the flames. Smoke from some electrical apparatus may be toxic. Take the necessary measures to prevent breathing the fumes.

MISSILE FIRES (WITH OR WITHOUT WARHEADS)

11-58. When flammable and explosive components for guided missiles and heavy rockets are properly stored, fire-prevention precautions and fire-extinguishing procedures are simple. The missiles' training manuals or standard texts list the appropriate extinguishing agent for each combustible component.

11-59. When a missile is being placed in the *ready* condition, the flammable and explosive components are close together. The method and duration of a fire-extinguishing action changes. Extinguishing actions are further complicated because one agent may not be correct for other components involved.

11-60. Because missiles are different in type, size, and design, fire personnel cannot establish general-fire plans and standards to cover all missiles. Commanders of missile units must have detailed fire plans, and every member of the unit must know what to do in any circumstance. When a fire does occur, all personnel not involved in extinguishing the fire or relocating other missiles will evacuate the area.

INERT MISSILE

11-61. An inert missile is an unfueled missile without a warhead, boosters, solid propellant motors, or other dangerous components. Use the following procedures when an inert missile is involved in a fire:

- Use any available extinguishing agent and appliance.
- Do not direct straight water streams against burning magnesium. A violent reaction and splattering of the molten metal will occur.
- Use a chemical extinguisher or water to extinguish the fires that are adjacent to the burning magnesium. Doing so helps reduce the temperature of the magnesium below its ignition point.

PARTIALLY COMPLETED MISSILE

11-62. When a partially or completely fueled, liquid-propellant missile, without a warhead or boosters, is involved in a fire, direct large volumes of water at its base. Use foam if the burning fuel is a flammable liquid. If a fire is

on the ground, try to flush the burning fuel away from the missile or try to relocate the missile. All personnel will evacuate the area when and if—

- The surface of the missile starts to melt.
- You can see the brilliant white glow of burning magnesium.
- Destroying the missile cannot be prevented.
- Smoke and flames prevent you from determining the condition of the missile.

COMPLETE MISSILE

11-63. When a missile is fueled and it contains a warhead, take action only if you can extinguish the fire or control it so that the missile will not be enveloped in flames. If a fire is on the ground, apply large volumes of water or foam to flush any burning liquid away from the missile. If the water supply is sufficient, direct a water stream on the surface of the missile to cool it.